AMENDMENTS TO THE SPECIFICATION

On Page 1, please change the title of the Invention to:

"OPTICAL-WIRELESS <u>HYBRID TRANSMISSION</u> SYSTEM AND OPTICAL-WIRELESS <u>HYBRID TRANSMISSION</u> METHOD"

On Page 1, please add the following paragraph after the title, and before the heading "*TECHNICAL FIELD*":

<u>CROSS-REFERENCE TO RELATED APPLICATION</u>

This application is based upon and claims the benefit of priority from Japanese Patent Application Nos. 2004-185956 and 2005-075305, each filed on June 24, 2004 and March 16, 2005, entire contents of which are incorporated herein by reference.

Please replace Paragraph [0043] beginning on line 13 of Page 16 with the following paragraph rewritten in amendment format:

As described above, the fourth invention not only enables high-sensitivity optical detection as in the third invention but also can realize optical detection without being influenced by dispersion in the optical transmission lines by compensating for a time difference occurring between the output signal of the first electrical demodulator and the output electrical signal of the second electrical demodulator due to the dispersion. Where as in the case of

the first invention the one-wave optical signal ~~(Formula (2))~~ <u>(Formula (1))</u> is transmitted from the optical transmitter to the base station and the modulated optical signal (Formula (3)) is transmitted from the base station to the optical receiver, influences of dispersion in the optical transmission lines appear in the modulated optical signal having the double sideband components. Where as in the second invention the two-wave polarization-coupled optical signal (Formula (7)) is transmitted from the optical transmitter to the base station and the modulated optical signal (Formula (9)) is transmitted from the base station to the optical receiver, influences of dispersion in the optical transmission lines appear in both optical signals.

Please replace Paragraph [0065] beginning on line 12 of Page 24 with the following paragraph rewritten in amendment format:

The electric field $E_{IF}(i)$ of the electrical signal having the intermediate frequencies f_{IF1} and f_{IF2} and output from the photodetector is given by the following formula:

$$\begin{aligned}
E_{IF}(i) &\propto (m(i)/\gamma(i))\cdot a_i[A_{LO}(i)\cdot A_C\cdot\cos\theta\cdot\cos(2\pi f_{IF1}t+\phi_1) \\
&\quad + A_{LO}(i)\cdot A_C\cdot\sin\theta\cdot\cos(2\pi f_{IF2}t+\phi_2)] \\
&= (1/k(i))\cdot a_i[A_{LO}(i)\cdot A_C\cdot\cos\theta\cdot\cos(2\pi f_{IF1}t+\phi_1) \\
&\quad + A_{LO}(i)\cdot A_C\cdot\sin\theta\cdot\cos(2\pi f_{IF2}t+\phi_2)] \qquad \cdots(27) \\
&(\phi_1 = \pm\,[4\pi f_{c1}T+\phi_1(t+2T)-\phi_2(t)]\,) \\
&(\phi_2 = \pm\,[4\pi f_{c1}T+\phi_1(t+2T)-\phi_3(t)]\,)
\end{aligned}$$

where ψ_1 and ψ_2 are phase components of the respective electrical signals having the intermediate frequencies f_{IF1} and f_{IF2}, and θ is an angle formed by the polarization direction of the modulated optical signal (Formula (25))

transmitted from the base station and the polarization direction of the optical signal represented by the first term of ~~Formula (25)~~ Formula (24) of the polarization-coupled optical signal that is output from the optical transmitter. And k(i) is a coefficient that depends on the optical fiber transmission length and the wireless transmission length of each link and represents an amplitude component of the modulated optical signal. The coefficient k(i) satisfies the following formula:

$$k(i) = \gamma(i) / m(i) \qquad \cdots(28)$$

Please replace Paragraph [0083] beginning on Line 15 of Page 30 with the following paragraphs rewritten in amendment format:

The electric field $E_{opt\text{-}c}(i)$ of the polarization-coupled optical signal transmitted to each base station and the electric field $E_{opt\text{-}LO}(i)$ of the ~~polarization-coupled~~ optical signal output to each optical receiver are given by the following formulae:

$$E_{opt\text{-}c}(i) = A_C(i)\cos(2\pi f_{C2}t + \phi_2(t)) + A_C(i)\cos(2\pi f_{C3}t + \phi_3(t)) \cdots(37)$$
$$E_{opt\text{-}LO}(i) = A_{LO}\cos(2\pi f_{C1}t + \phi_1(t)) \cdots(38)$$

where i is an identification number indicating each base station-optical receiver link, $A_C(i)$ and A_{LO} are electric amplitudes, and $\phi_1(t)$, $\phi_2(t)$, and $\phi_3(t)$ are phase-noise components of the output optical signals of the single-mode optical sources. The first and second terms on the right side of Formula (37) have orthogonal polarization directions and the same amplitude.

Please replace Paragraph [0085] beginning on Line 13 of Page 31 with the following paragraph rewritten in amendment format:

Each of the optical receivers couples the optical signal (Formula (38)) that is output from the optical transmitter with the modulated optical signal (Formula (39)) transmitted from the base station, and then square-law-detects a resulting coupled optical signal with the photodetector. The electric field E_{opt-co} of the coupled optical signal is given by the following formula:

$$\begin{aligned}\cancel{E_{opt-co}(i) = A_{LO}\cos(2\pi f_{C1}t + \phi_1(t))} \\ \cancel{+(1/\gamma(i))(1+ma_i\cos 2\pi f_{RF}t)} \\ \cancel{\cdot [A_C(i)\cos(2\pi f_{C2}(t+2T)+\phi_2(t+2T))} \\ \cancel{+A_C(i)\cos(2\pi f_{C3}(t+2T)+\phi_3(t+2T))]} \quad \cdots(40)\end{aligned}$$

$$\begin{aligned}\underline{E_{opt-co}(i) = A_{LO}\cos(2\pi f_{C1}t + \phi_1(t))} \\ +\underline{(1/\gamma(i))(1+m(i)\ a_i\cos 2\pi f_{RF}t)} \\ \underline{\cdot\ [A_C(i)\cos(2\pi f_{C2}(t+2T)+\phi_2(t+2T))} \\ \underline{+A_C(i)\cos(2\pi f_{C3}(t+2T)+\phi_3(t+2T))\ ]} \quad \cdots(40)\end{aligned}$$

where $\gamma(i)$ is the sum of an optical transmission loss of each base station-optical receiver link, an insertion loss of the optical modulator in the base station, and other losses ($\gamma(i) >> 1$).

Please replace Paragraph [0087] beginning on Line 7 of Page 32 with the following paragraph rewritten in amendment format:

The electric field $E_{IF}(i)$ of the electrical signal including the two waves having the intermediate frequencies f_{IF1} and f_{IF2} and output from the photodetector is given by the following formula:

$$\cancel{E_{IF}(i) \propto (m(i)/\gamma(i)) \cdot a_i\,[A_C(i) \cdot A_{LO} \cdot \cos\theta \cdot \cos(2\pi f_{IF1} t + \phi_1)}$$
$$\cancel{+ A_C(i) \cdot A_{LO} \cdot \sin\theta \cdot \cos(2\pi f_{IF2} t + \phi_2)\,]} \quad \cdots(41)$$
$$\cancel{(\phi_1 = \pm\,[4\pi f_{C2} T + \phi_2(t+2T) - \phi_1(t)]\,)}$$
$$\cancel{(\phi_2 = \pm\,[4\pi f_{C3} T + \phi_3(t+2T) - \phi_1(t)]\,)}$$

$$\underline{E_{IF}(i) \propto (m(i)/\gamma(i)) \cdot a_i\,[A_C(i) \cdot A_{LO} \cdot \cos\theta \cdot \cos(2\pi f_{IF1} t + \phi_1)}$$
$$\underline{+ A_C(i) \cdot A_{LO} \cdot \sin\theta \cdot \cos(2\pi f_{IF2} t + \phi_2)\,]}$$
$$\underline{= (1/k(i)) \cdot a_i\,[A_C(i) \cdot A_{LO} \cdot \cos\theta \cdot \cos(2\pi f_{IF1} t + \phi_1)}$$
$$\underline{+ A_C(i) \cdot A_{LO} \cdot \sin\theta \cdot \cos(2\pi f_{IF2} t + \phi_2)\,]} \quad \cdots(41)$$
$$(\phi_1 = \pm\,[4\pi f_{C2} T + \phi_2(t+2T) - \phi_1(t)]\,)$$
$$(\phi_2 = \pm\,[4\pi f_{C3} T + \phi_3(t+2T) - \phi_1(t)]\,)$$

where ψ_1 and ψ_2 are phase components of the respective electrical signals having the intermediate frequencies f_{IF1} and f_{IF2}, and θ is an angle formed by the polarization direction of the f_{C2} element of the modulated optical signal (Formula (39)) transmitted from the base station and the polarization direction of the optical signal (Formula 38)) ~~by the first term of Formula (37) of the polarization-coupled optical signal~~ that is transmitted from the optical transmitter. And k(i) is a coefficient that depends on the optical fiber transmission length and the wireless transmission length of each link and

represents an amplitude component of the modulated optical signal. The coefficient k(i) satisfies the following formula:

$$k(i) = \gamma(i) / m(i) \qquad \cdots(42)$$

Please replace Paragraph [0093] beginning on Line 7 of Page 34 with the following paragraph rewritten in amendment format:

In the ~~10th~~ 11th invention, the optical transmitter transmits, to the plural base stations, the polarization-coupled optical signals each including the two waves, that is, the second single-mode optical signal and the third single-mode optical signal, and outputs the first single-mode optical signals to the plural optical receivers at prescribed optical powers, respectively.

Please replace Paragraph [0094] beginning on Line 13 of Page 34 with the following paragraph rewritten in amendment format:

The electric field $E_{opt\text{-}c}(i)$ of the polarization-coupled optical signal transmitted to each base station and the electric field $E_{opt\text{-}LO}(i)$ of the optical signal output to each optical receiver are given by the following formulae:

$$E_{opt\text{-}c}(i) = A_C \cos(2\pi f_{C2} t + \phi_2(t)) + A_C \cos(2\pi f_{C3} t + \phi_3(t)) \qquad \cdots(44)$$
$$E_{opt\text{-}LO}(i) = A_{LO}(i) \cos(2\pi f_{C1} t + \phi_1(t)) \cdots(45)$$

where i is an identification number indicating each base station-optical receiver link, A_C and $A_{LO}(i)$ are electric amplitudes, and $\phi_1(t)$, $\phi_2(t)$, and $\phi_3(t)$ are phase-noise components of the output optical signals of the single-mode

optical sources. The first and second terms on the right side of ~~Formula (45)~~ Formula (44) have orthogonal polarization directions and the same amplitude.

Please replace Paragraph [0096] beginning on Line 11 of Page 35 with the following paragraph rewritten in amendment format:

Each of the optical receivers couples the ~~polarization-coupled optical signal (Formula (44))~~ the optical signal (Formula (45)) that is output from the optical transmitter with the modulated optical signal (Formula (46)) transmitted from the base station, and then square-law-detects a resulting coupled optical signal with the photodetector. The electric field $E_{opt\text{-}co}$ of the coupled optical signal is given by the following formula:

$$\begin{aligned}\cancel{E_{opt-co}(i)} &\cancel{= A_{LO}(i)\cos(2\pi f_{C1}t+\phi_1(t))}\\ &\cancel{+(1/\gamma(i))(1+ma_i\cos 2\pi f_{RF}t)}\\ &\cancel{\cdot[A_C\cos(2\pi f_{C2}(t+2T)+\phi_2(t+2T))}\\ &\cancel{+A_C\cos(2\pi f_{C3}(t+2T)+\phi_3(t+2T))]} \quad \cdots(47)\end{aligned}$$

$$\begin{aligned}E_{opt-co}(i) &= A_{LO}(i)\cos(2\pi f_{C1}t+\phi_1(t))\\ &+(1/\gamma(i))(1+m(i)\ a_i\cos 2\pi f_{RF}t)\\ &\cdot\ [A_C\cos(2\pi f_{C2}(t+2T)+\phi_2(t+2T))\\ &+A_C\cos(2\pi f_{C3}(t+2T)+\phi_3(t+2T))] \quad \cdots(47)\end{aligned}$$

where $\gamma(i)$ is the sum of an optical transmission loss of each base station-optical receiver link, an insertion loss of the optical modulator in the base station, and other losses ($\gamma(i) >> 1$).

Please replace Paragraph [0098] beginning on Line 5 of Page 36 with the following paragraph rewritten in amendment format:

The electric field $E_{IF}(i)$ of the electrical signal including the two waves having the intermediate frequencies f_{IF1} and f_{IF2} and output from the photodetector is given by the following formula:

$$\cancel{E_{IF}(i) \propto (m(i)/\gamma(i)) \cdot a_i [A_C \cdot A_{LO}(i) \cdot \cos\theta \cdot \cos(2\pi f_{IF1} t + \phi_1)}$$
$$\cancel{+ A_C \cdot A_{LO}(i) \cdot \sin\theta \cdot \cos(2\pi f_{IF2} t + \phi_2)]} \quad \cdots(48)$$
$$\cancel{(\phi_1 = \pm [4\pi f_{C2} T + \phi_2(t+2T) - \phi_1(t)])}$$
$$\cancel{(\phi_2 = \pm [4\pi f_{C3} T + \phi_3(t+2T) - \phi_1(t)])}$$

$$\underline{E_{IF}(i) \propto (m(i)/\gamma(i)) \cdot a_i [A_C \cdot A_{LO}(i) \cdot \cos\theta \cdot \cos(2\pi f_{IF1} t + \phi_1)}$$
$$\underline{+ A_C \cdot A_{LO}(i) \cdot \sin\theta \cdot \cos(2\pi f_{IF2} t + \phi_2)]}$$
$$\underline{= (1/k(i)) \cdot a_i [A_C \cdot A_{LO}(i) \cdot \cos\theta \cdot \cos(2\pi f_{IF1} t + \phi_1)}$$
$$\underline{+ A_C \cdot A_{LO}(i) \cdot \sin\theta \cdot \cos(2\pi f_{IF2} t + \phi_2)]} \quad \cdots(48)$$
$$\underline{(\phi_1 = \pm [4\pi f_{C2} T + \phi_2(t+2T) - \phi_1(t)])}$$
$$\underline{(\phi_2 = \pm [4\pi f_{C3} T + \phi_3(t+2T) - \phi_1(t)])}$$

where ψ_1 and ψ_2 are phase components of the respective electrical signals having the intermediate frequencies f_{IF1} and f_{IF2}, and θ is an angle formed by the polarization direction of the $\underline{f_{C2}}$ element of the modulated optical signal (Formula (46)) transmitted from the base station and the polarization direction of the optical signal (Formula 45)) ~~represented by the first term of Formula (44) of the polarization-coupled optical signal~~ that is output from the optical transmitter. And k(i) is a coefficient that depends on the optical fiber

transmission length and the wireless transmission length of each link and represents an amplitude component of the modulated optical signal. The coefficient k(i) satisfies the following formula:

$$k(i) = \gamma(i) / m(i) \qquad \cdots(49)$$

Please replace Paragraph [0100] beginning on Line 2 of Page 37 with the following paragraph rewritten in amendment format:

Further, since the output-power-controllable optical splitter of the optical transmitter controls the optical powers of the optical signals that are output to the respective optical receivers ~~polarization-coupled optical signals that are transmitted to the respective base stations~~, it is possible to control the signal power of the electrical signal having the intermediate frequencies f_{IF1} and f_{IF2} obtained as the output of the photodetector of each optical receiver.

Please replace Paragraph [0107] beginning on Line 8 of Page 39 with the following paragraph rewritten in amendment format:

Each of the optical receivers couples the optical signal (Formula (52)) that is output from the optical transmitter with the modulated optical signal (Formula (53)) transmitted from the base station, and then square-law-detects a resulting coupled optical signal with the photodetector. The electric field $E_{opt\text{-}co}(i)$ of the coupled optical signal is given by the following formula:

$$\cancel{E_{opt-co}(i) = A_{LO}(i)\cos(2\pi f_{C1}t+\phi_1(t)) + (1/\gamma(i))(1+ma_i\cos 2\pi f_{RF}t) \cdot [A_C(i)\cos(2\pi f_{C2}(t+2T)+\phi_2(t+2T)) + A_C(i)\cos(2\pi f_{C3}(t+2T)+\phi_3(t+2T))]} \cdots (54)$$

$$\underline{E_{opt-co}(i) = A_{LO}(i)\cos(2\pi f_{C1}t+\phi_1(t)) + (1/\gamma(i))(1+m(i)\ a_i\cos 2\pi f_{RF}t) \cdot [A_C(i)\cos(2\pi f_{C2}(t+2T)+\phi_2(t+2T)) + A_C(i)\cos(2\pi f_{C3}(t+2T)+\phi_3(t+2T))]} \cdots (54)$$

where $\gamma(i)$ is the sum of an optical transmission loss of each base station-optical receiver link, an insertion loss of the optical modulator in the base station, and other losses ($\gamma(i) >> 1$).

Please replace Paragraph [0109] beginning on line 1 of page 40 with the following paragraph rewritten in amendment format:

The electric field $E_{IF}(i)$ of the electrical signal having the intermediate frequencies f_{IF1} and f_{IF2} that is output from the photodetector is given by the following formula:

$$\begin{aligned} E_{IF}(i) &\propto (m(i)/\gamma(i))\cdot a_i[A_{LO}(i)\cdot A_C(i)\cdot\cos\theta\cdot\cos(2\pi f_{IF1}t+\phi_1) \\ &\quad + A_{LO}(i)\cdot A_C(i)\cdot\sin\theta\cdot\cos(2\pi f_{IF2}t+\phi_2)] \\ &= (1/k(i))a_i[A_{LO}(i)\cdot A_C(i)\cdot\cos\theta\cdot\cos(2\pi f_{IF1}t+\phi_1) \\ &\quad + A_{LO}(i)\cdot A_C(i)\cdot\sin\theta\cdot\cos(2\pi f_{IF2}t+\phi_2)] \quad \cdots (55) \\ &(\phi_1 = \pm[4\pi f_{c2}T+\phi_2(t+2T)-\phi_1(t)]) \\ &(\phi_2 = \pm[4\pi f_{c3}T+\phi_3(t+2T)-\phi_1(t)]) \end{aligned}$$

where ψ_1 and ψ_2 are phase components of the respective electrical signals having the intermediate frequencies f_{IF1} and f_{IF2}, and θ is an angle formed by

the polarization direction of the f_{C2} element of the modulated optical signal (Formula (53)) transmitted from the base station and the polarization direction of the optical signal (Formula (52)) that is output from the optical transmitter ~~of the optical signal represented by the first term of Formula (51) of the polarization-coupled optical signal that is transmitted from the optical transmitter~~. And k(i) is a coefficient that depends on the optical fiber transmission length and the wireless transmission length of each link and represents an amplitude component of the modulated optical signal. The coefficient k(i) satisfies the following formula:

$$k(i) = \gamma(i) / m(i) \qquad \cdots(56)$$

Please replace Paragraph [0121] beginning on line 1 of page 44 with the following paragraph rewritten in amendment format:

Therefore, the total P_{all} of the optical signal powers supplied from the optical transmitter to all the optical receivers is given by

$$\cancel{P_{all} \geqq \Sigma R\{A_{LO}(i)\}^2 [i=1\sim N]} \\ \cancel{= (RA_{th}^2 / A_c^2) \cdot k_{max}^2 N} \qquad \cdots(67)$$

$$\underline{P_{all} = \Sigma R \{A_{LO}(i)\}^2 [i=1\sim N]} \\ \underline{\geqq (RA_{th}^2 / A_c^2) \cdot k_{max}^2 N} \qquad \cdots(67)$$

where R is a proportionality constant.

Please replace Paragraph [0122] beginning on line 6 of page 44 with the following paragraph rewritten in amendment format:

On the other hand, in this invention, the total P_{all}' of the optical signal powers supplied to all the optical receivers is given by

$$\cancel{P_{all}' \geqq \Sigma R\{A_{LO}(i)\}^2 [i=1 \sim N]}$$
$$\cancel{= (RA_{th}{}^2 / A_c{}^2) \cdot \Sigma \{k(i)\}^2 [i=1 \sim N]} \quad \cdots (68)$$

$$\underline{P_{all}' = \Sigma R \{A_{LO}(i)\}^2 [i=1 \sim N]}$$
$$\underline{\geqq (RA_{th}^2 / A_c^2) \cdot \Sigma \{k(i)\}^2 [i=1 \sim N]} \quad \cdots (68)$$

Please replace Paragraph [0129] beginning on line 21 of page 45 with the following paragraph rewritten in amendment format:

The same effect is also obtained in the case of adjusting the optical powers of the optical signals to be transmitted to the base stations ~~or~~ <u>and/or</u> the optical signals to be output to the optical receivers in any of the seventh, ninth, ~~10th, and 11th~~ <u>and 10th to 12th</u> inventions.

Please replace Paragraph [0131] beginning on line 10 of page 46 with the following paragraph rewritten in amendment format:

For example, in the configuration in which as in the eighth invention the split first single-mode optical signals are transmitted to the plural base

stations and the polarization-coupled optical signals are output to the plural optical receivers at prescribed optical powers, respectively, the signal-to-noise ratio SNR of the electrical signal that is output from the photodetector of each optical receiver can be represented by the following formula:

$$
\begin{aligned}
SNR &= (S^2 \cdot P_{LO}(i) \cdot P_c \cdot a_i / k(i)^2) / (2eSP_{LO}(i)R_LB + 2kTFB) \\
&= \{(S^2 \cdot P_{LO}(i)) / (N_{shot}P_{LO}(i) + N_{thermal})\} P_s(i) \\
&= G(P_{LO}(i)) \cdot P_s(i) \quad \cdots(74)
\end{aligned}
$$

$$(P_s(i) = P_c \cdot a_i / k(i)^2,\ N_{shot} = 2eSR_LB,\ N_{thermal} = 2kTFB)$$

where S is the sensitivity of the photodetector, $P_{LO}(i)$ is the optical signal power to be output to the each optical receiver, $P_s(i)$ ~~$P_s(i)$~~ is the optical power of an SSB component of each link, R_L is the load resistance, e is the magnitude of the electronic charge, k is Boltzmann's constant, T is the temperature, F is the noise figure of the optical receiver, B is the signal bandwidth, and G(x) is the following function:

$$G(x) = S^2 x / (N_{shot}x + N_{thermal}) \quad \cdots(75)$$

Please replace Paragraph [0136] beginning on line 7 of page 48 with the following paragraph rewritten in amendment format:

The same effect is also obtained in the case of adjusting the optical powers of the optical signals to be transmitted to the base stations and/or the optical signals to be output to the optical receivers in any of the seventh, ninth, and 10th to 12th inventions.

On Page 52, after the heading *"BRIEF DESCRIPTION OF THE DRAWINGS"*, please add the following paragraph before paragraph [0147] beginning at line 7:

The nature, principle, and utility of the invention will become more apparent from the following detailed description when read in conjunction with the accompanying drawings in which like parts are designated by identical reference numbers, in which:

Please replace Paragraph [0151] beginning on line 15 of page 55 with the following paragraph rewritten in amendment format:

The optical receiver 120(A) receives the modulated optical signal 1g transmitted from the ~~optical transmitter 301~~ the optical modulator 301 of the base station 300 and the polarization-coupled optical signal 1d that is output from the polarization coupling part 114 of the optical transmitter 110(A1) of the central office 100, and reproduces transmit-data 1k corresponding to the transmit-data 1e that is transmitted from the wireless terminal 400 via the base station 300.

Please replace Paragraph [0152] beginning on line 21 of page 55 with the following paragraph rewritten in amendment format:

Fig. 2 shows an exemplary configuration of the polarization coupling part 114. As shown in the figure, the single-mode optical signals 1b and 1c are adjusted by polarization controllers 1141 and 1142 so that their

polarization directions become perpendicular to each other, then adjusted by output adjusters 1143 and 1144 so that their optical powers become identical, and finally orthogonal-polarization-coupled with each other by a polarization-maintain ~~optical coupler 145~~ optical coupler 1145 into the polarization-coupled optical signal 1d which is output. This configuration is just an example; for example, another configuration is possible in which the single-mode optical sources 112 and 113 have the functions of the polarization controllers 1141 and 1142 and the output adjusters 1143 and 1144 and the polarization coupling part 114 is formed by only the polarization-maintain ~~optical coupler 145~~ optical coupler 1145.

Please replace Paragraph [0167] beginning on Line 18 of Page 60 with the following paragraph rewritten in amendment format:

The optical receiver 120(B) receives the modulated optical signal 2g transmitted from the ~~optical transmitter 301~~ optical modulator 301 of the base station 300 and the optical signal 2a having the optical frequency f_{C1} that is output from the single-mode optical source 111 of the optical transmitter ~~110(A1)~~ 110(B1) of the central office 100, and reproduces transmit-data 2k corresponding to the transmit-data 2e that is transmitted from the wireless terminal 400 via the base station 300.

Please replace Paragraph [0168] beginning on Line 25 of Page 60 with the following paragraph rewritten in amendment format:

Fig. 10 shows an exemplary configuration of the polarization coupling part 114. As shown in the figure, the single-mode optical signals 2b and 2c are adjusted by polarization controllers 1141 and 1142 so that their polarization directions become perpendicular to each other, then adjusted by output adjusters 1143 and 1144 so that their optical powers become identical, and finally orthogonal-polarization-coupled with each other by a polarization-maintain optical coupler ~~145~~ 1145 into the polarization-coupled optical signal 2d which is output. This configuration is just an example; for example, another configuration is possible in which the single-mode optical sources 112 and 113 have the functions of the polarization controllers 1141 and 1142 and the output adjusters 1143 and 1144 and the polarization coupling part 114 is formed by only the polarization-maintain optical coupler ~~145~~ 1145.

Please replace Paragraph [0183] beginning on Line 20 of Page 65 with the following paragraph rewritten in amendment format:

The optical receivers 120(A)-1 to 120(A)-3 receive the modulated optical signal 1g1 to 1g3 transmitted from ~~the optical transmitters~~ the optical modulators 301-1 to 301-3 of the base stations ~~300~~ 300-1 to 300-3 and the split polarization-coupled optical signal 1d that are output from the optical splitter 116 of the optical transmitter 110(A2) of the central office 100 and reproduce transmit-data 1k1 to 1k3, respectively.

Please replace Paragraph [0188] beginning on Line 15 of Page 67 with the following paragraph rewritten in amendment format:

The optical receivers 120(B)-1 to 120(B)-3 receive the modulated optical signal 2g1 to 2g3 transmitted from the ~~optical transmitters 301~~ the optical modulators 301-1 to 301-3 of the base stations ~~300~~ 300-1 to 300-3 and the split optical signal 2a that are output from the optical splitter 115 of the optical transmitter 110(B2) of the central office 100 and reproduce transmit-data 2k1 to 2k3, respectively.

Please replace Paragraph [0197] beginning on Line 25 of Page 71 with the following paragraph rewritten in amendment format:

This embodiment assumes a case that optical power differences occur between the modulated optical signals 2g1 to 2g3 received by the respective optical receivers 120(B)-1 to 120(B)-3 due to optical losses that depend on the optical fiber transmission lengths between the central office 100 and the base stations 300-1 and 300-3 and the differences between RF signal powers that depend on the wireless transmission lengths between the base stations 300-1 to 300-3 and the wireless terminals. The optical powers of the optical carrier signals (polarization-coupled optical signals 2d) to be transmitted to the respective base stations 300-1 to 300-3 are adjusted by the output-power-controllable optical splitter 118 according to the above situation. With this measure, the optical power (f_{C2}, $f_{C2}\pm f_{RF}$, f_{C3}, and $f_{C3}\pm f_{RF}$ components) of the modulated optical signal 2g transmitted from each base station 300 and

the optical power (f_{C2}, $f_{C2} \pm f_{RF}$, f_{C3}, and $f_{C3} \pm f_{RF}$ components) of the coupled optical signal 2h that is output from the optical coupler 121 of each optical receiver ~~120(A)~~ 120(B) are adjusted as shown in Fig. 26. As a result, the signal power of the electrical signal 2i having the intermediate frequencies f_{IF1} and f_{IF2} in each optical receiver 120(B) is adjusted and a good receiving operation (described later) can thereby be realized.

Please replace Paragraph [0199] beginning on Line 1 of Page 73 with the following paragraph rewritten in amendment format:

This embodiment assumes a case that optical power differences occur between the modulated optical signals 2g1 to 2g3 received by the respective optical receivers 120(B)-1 to 120(B)-3 due to optical losses that depend on the optical fiber transmission lengths between the central office 100 and the base stations 300-1 and 300-3 and the differences between RF signal powers that depend on the wireless transmission lengths between the base stations 300-1 to 300-3 and the wireless terminals. The optical powers of the optical signals 2a to be output to the respective optical receivers ~~120(A)-1 to 120(A)-3~~ 120(B)-1 to 120(B)-3 are adjusted by the output-power-controllable optical splitter 117 according to the above situation. With this measure, the optical power (f_{C1} component) of the coupled optical signal 2h that is output from the optical coupler 121 of each optical receiver 120(B) is adjusted as shown in Fig. 26. As a result, the signal power of the electrical signal 2i having the intermediate frequencies f_{IF1} and f_{IF2} in each optical

receiver 120(B) is adjusted and a good receiving operation (described later) can thereby be realized.

Please replace Paragraph [0201] beginning on Line 1 of Page 74 with the following paragraph rewritten in amendment format:

This embodiment assumes a case that optical power differences occur between the modulated optical signals 2g1 to 2g3 received by the respective optical receivers 120(B)-1 to 120(B)-3 due to optical losses that depend on the optical fiber transmission lengths between the central office 100 and the base stations 300-1 and 300-3 and the differences between RF signal powers that depend on the wireless transmission lengths between the base stations 300-1 to 300-3 and the wireless terminals. The optical powers of the optical carrier signals (polarization-coupled optical signals 2d) to be transmitted to the respective base stations 300-1 to 300-3 are adjusted by the output-power-controllable optical splitter 118 according to the above situation. With this measure, the optical power (f_{C2}, $f_{C2} \pm f_{RF}$, f_{C3}, and $f_{C3} \pm f_{RF}$ components) of the modulated optical signal 2g transmitted from each base station 300 and the optical power (f_{C2}, $f_{C2} \pm f_{RF}$, f_{C3}, and $f_{C3} \pm f_{RF}$ components) of the coupled optical signal 2h that is output from the optical coupler 121 of each optical receiver 120(B) are adjusted as shown in Fig. 26. Further, the optical powers of the optical signals 2a to be output to the respective optical receivers ~~120(A)-1 to 120(A)-3~~ 120(B)-1 to 120(B)-3 are adjusted by the output-power-controllable optical splitter 117. With this measure, the optical power (f_{C1}

component) of the coupled optical signal 2h that is output from the optical coupler 121 of each optical receiver 120(B) is adjusted as shown in Fig. 26. As a result, the signal power of the electrical signal having the intermediate frequencies f_{IF1} and f_{IF2} in each optical receiver 120(B) is adjusted and a good receiving operation (described later) can thereby be realized.

On page 75, please insert the following paragraph, after the final paragraph of *BEST MODE FOR CARRYING OUT THE INVENTION,* and before the section *"INDUSTRIAL APPLICABILITY",* beginning on line 15:

The invention is not limited to the above embodiments and various modifications may be made without departing from the spirit and scope of the invention. Any improvement may be made in part or all of the components.